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**From:** Paul Whatling [Paul.Whatling@fmc.com]  
**Sent:** 8/26/2016 4:50:54 PM  
**To:** Jakob, Avivah [Jakob.Avivah@epa.gov]  
**CC:** Sherman, Kelly [Sherman.Kelly@epa.gov]; Snyderman, Steven [Snyderman.Steven@epa.gov]; Karl Malamud-Roam [kmr@AESOP.Rutgers.edu]  
**Subject:** RE: Malathion Stereochemistry

Hi Avivah

Just to follow up on Karl's note. In our response to the Agency's draft ESA biological evaluation, we provided information related to where malathion is being used for mosquito control in the US. This was developed based on a survey from AMCA, Cheminova's historical sales data for the FYFANON ULV Mosquito product information obtained from our exclusive distributor of that product. As you will see, we are selling the product to mosquito control managers/districts throughout much of the US (not just in CA, FLA and LA). This does not include sales information from other registrants of mosquito control products.

Best regards,

Paul

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**From:** Karl Malamud-Roam [mailto:kmr@AESOP.Rutgers.edu]  
**Sent:** Friday, August 26, 2016 8:05 AM  
**To:** 'Jakob, Avivah'  
**Cc:** Paul Whatling; 'Sherman, Kelly'; 'Snyderman, Steven'  
**Subject:** RE: Malathion Stereochemistry

Avivah,

Sorry if I wasn't clear -- the document I attached to this note was the Malathion Mosquitocide Use Report from the ESA submittal. I think it was/is immediately relevant to yesterday's discussion.

Thanks for your consideration,  
Karl

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**From:** Jakob, Avivah [mailto:Jakob.Avivah@epa.gov]  
**Sent:** Thursday, August 25, 2016 12:46 PM  
**To:** Karl Malamud-Roam  
**Cc:** 'Paul Whatling'; Sherman, Kelly; Snyderman, Steven  
**Subject:** RE: Malathion Stereochemistry

Thanks Karl -- this is also in reference to the stereochemistry question, right?

And as a reminder, we will not be focusing on these points this afternoon.

Avivah Jakob  
Team Leader, Risk Management Implementation Branch III (RMIB3)  
Office of Pesticide Programs, Environmental Protection Agency  
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[Jakob.avivah@epa.gov](mailto:Jakob.avivah@epa.gov)

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**From:** Karl Malamud-Roam [<mailto:kmr@AESOP.Rutgers.edu>]

**Sent:** Thursday, August 25, 2016 12:39 PM

**To:** Jakob, Avivah <[Jakob.Avivah@epa.gov](mailto:Jakob.Avivah@epa.gov)>

**Cc:**

**Subject:** RE: Malathion Stereochemistry

Avivah,

One other important document – sorry for the late notice, but I just got permission to distribute this.

Karl

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**From:** Karl Malamud-Roam [<mailto:kmr@aesop.rutgers.edu>]

**Sent:** Thursday, August 25, 2016 12:17 PM

**To:** 'Jakob, Avivah'

**Cc:** 'Paul Whatling'; 'Sherman, Kelly'; 'Snyderman, Steven'

**Subject:** RE: Malathion Stereochemistry

Thanks, Aviva.

Please consider forwarding the two attached review articles on ULV to the participants – I have done so for the AMCA folks, and I think they are useful references that cover most previously published work on this topic.

Karl

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**From:** Jakob, Avivah [<mailto:Jakob.Avivah@epa.gov>]

**Sent:** Wednesday, August 24, 2016 4:31 PM

**To:** Karl Malamud-Roam

**Cc:** Paul Whatling; Sherman, Kelly; Snyderman, Steven

**Subject:** RE: Malathion Stereochemistry

Karl-

Thank you for sending along your questions. As we discussed earlier today and you mention in your email, tomorrows workshop has a specific scope which is to better understand the technical feasibility and efficacy of different aerial application parameters for malathion mosquito adulticide use. Although we won't be addressing the questions provided in your email tomorrow, independent of the workshop, I will certainly share them with the appropriate folks here at EPA.

It was a pleasure speaking with you this morning and I look forward to tomorrows conversation. Also, I'm cc'ing Steven Snyderman who is the Chemical Review Manager (CRM) in PRD for malathion. He is the primary point of contact for malathion and will also be able to help w/ any future questions you may have.

Regards,

Avivah Jakob

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**From:** Karl Malamud-Roam [<mailto:kmr@AESOP.Rutgers.edu>]

**Sent:** Wednesday, August 24, 2016 1:13 PM

**To:** Jakob, Avivah <[Jakob.Avivah@epa.gov](mailto:Jakob.Avivah@epa.gov)>

**Cc:** Paul Whatling <[Paul.Whatling@fmc.com](mailto:Paul.Whatling@fmc.com)>

**Subject:** Malathion Stereochemistry

Hi Avivah,

Thanks for your time on the phone this morning.

To summarize my first question, I'm interested in the stereochemistry of OP's in general, and Malathion in particular. Does EPA have any written report on S/R differentiation in the fate or effects of malathion or its degradates?

I've talked with Cheminova/FMC today, who assure me that the formulated products in the U.S. market are all racemic. In the literature, there is discussion of stereo effects in the toxicity of some degradates, but I find little evidence of stereoselective degradation mechanisms, although it seems possible that enzymatic degradation could lead to enrichment of one form or another.

I don't think this is particularly relevant for our discussion tomorrow or the ESA workshop in a couple of weeks, but I do suggest that it's worth making a clear statement in the risk assessments before they are finalized.

Thanks again for any thoughts, and I look forward to chatting tomorrow.

Karl

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